IV. *An Account of ſome* Magnetical Obſervations *made in the Months of* May, June *and* July, 1732, *in the* Atlantick *or* Weſtern Ocean; *as alſo the Deſcription of a* Water-Spout, *by Mr.* Joſeph Harris. *Communicated by Mr.* George Graham, *F. R. S.*

THE Knowledge of the Magnetical Variation is of ſuch Conſequence to the Mariner, that without it he cannot know his Courſe; and were the Theory thereof once eſtabliſhed, it might be of great uſe for eſtimating the Longitude in ſeveral Parts of the World, as has been often and very juſtly obſerved by others. But 'till this be determin'd, we muſt rely upon Obſervations.

I ſometime ſince took notice of the Imperfections of the common Azimuth Compaſs, and how ill adapted that Inſtrument is for the Purpoſe intended. I alſo gave the Deſcription of a new Inſtrument, whereby I propoſed to remedy the principal Objections to the former; and farther Experience has ſufficiently confirmed me in what I have ſaid. But I ſhould be glad to have it determined by thoſe who have convenient Opportunities of making Experiments of this kind, what would be the propereſt Diameter and Weight for a Needle and Card, and what ought to be their proportional Weights to each other when taken ſeparately: Regard being had that the Friction be no more than what is neceſſary to prevent the Card from being too much affected by the Motion of the Ship. Some Obſervations incline me to think, that a Sea-Card ſhould not exceed ſix Inches Diameter, and that moſt of thoſe generally uſed, are too heavy for nice Experiments, tho' they may be well enough adapted for common Purpoſes.

In the Months of *March* and *April*, 1732, the Variation at *Black-River* in *Jamaica*, was very accurately obſerved to be from 6° to 6° 05′ Eaſterly.

Off the *Havanna* about 4½ Deg. Eaſterly.

The reſt of the Obſervations I made, are expreſſed in the following Table.

Latitude. N.		Longit. from *London*, W.		Variat.	Latitude.		Longit. from *London*, W.		Variat.
Deg.	Min.	Deg.	Min.	Deg.	Deg.	Min	Deg.	Min.	Deg.
27	00	80	00	4 E.	35	55	65	30	5 W.
28	45	80	00	3½	38	06	60	30	6½
31	00	77	45	1¾	39	10	57	30	8⅓
32	15	72	30	00	39	40	56	30	8¾
32	40	72	00	1 W.	43	00	45	00	9½
32	45	71	30	1½	43	05	44	35	9½
32	52	70	40	2¼	44	40	35	15	11½
34	30	67	25	4⅓	47	20	20	20	11

The Inſtrument I uſed was ſo eaſily managed, that unleſs the Sea was pretty rough, an Obſervation might be depended upon to about a quarter of a Degree, had the Card performed to the ſame Exactneſs. But by comparing ſeveral Obſervations made under the like

like Circumſtances, as to the Weather, it ſeems to me as if the Virtue of the Needle was not always of equal Strength. Sometimes ſeveral Obſervations would agree exceedingly well; at other times the Card would ſtand indifferently any where within a Degree or more of its Meridian; and this I obſerv'd in ſeveral Cards. I found another Circumſtance which ſurprized me much: The Card would ſometimes differ about two Degrees from it ſelf betwixt the Morning and Evening of the ſame Day; and this Difference would continue as it were regularly for ſeveral Days, then vaniſh for a Week or more, and afterwards would return and continue as before.

The greatneſs of this Difference, and the near Agreement betwixt the Obſervations made in the ſame Forenoon, or Afternoon, amongſt themſelves, will not give me room to ſuſpect that it proceeded altogether from an Error in obſerving. I own I cannot account for it, but whatever be the Cauſe thereof, the Error was always the ſame way; that is, the Weſterly Variation in the Morning would be leſs than in the Afternoon. I carefully examined if this could be any ways owing to the Inſtrument, or to any Iron near the Place where it was uſually ſet for Obſervation; but I was fully convinced it could proceed from neither. I know not whether any ſuch Obſervations as theſe have been made before; but I think it would not be unuſeful, if thoſe who have proper Inſtruments, and are ſufficiently skilled, would communicate any thing of this kind that may occur.

It now appears that the Numbers in the 'foregoing Table cannot be ſtrictly accurate; but I think the Error can ſcarce any where exceed half a Degree; for in moſt Caſes ſeveral Obſervations were made pretty near together, of which I took a Medium, making Allowances according to the Circumſtances attending each: And perhaps they are as exact as can be well expected from Sea-Journals. And there can be no ſenſible Error as to Longitudes, our Reckoning, when we made the Land, happening to fall out to a more than uſual Exactneſs. I ſhall take another Opportunity to communicate ſome *Magnetical Obſervations* made with great Care at *Jamaica*.

To this I ſhall add the Deſcription of a *Water-Spout*, which we ſaw about Sun-ſet, *May* 21ſt, 1732, in the Latitude 32° 30′N. and Longitude 9° Eaſterly from the Meridian of Cape *Florida*. *Vide* TAB. *Fig.* 2.

When firſt we ſaw the *Spout*, it was whole and entire, and much of the Shape and Proportion of a Speaking-Trumpet (as expreſſed by the Figure annexed) the ſmall End being downwards, and reaching to the Sea, and the big End terminated in a black thick Cloud. The Spout itſelf was alſo very black, and the more ſo the higher up. It ſeemed to be exactly Perpendicular to the Horizon, and its Sides perfectly Smooth, without the leaſt Ruggedneſs. Where it fell the Spray of the Sea roſe to a conſiderable Height, which made ſomewhat of the Appearance of a great Smoak.

From the firſt time we ſaw it, it continued whole about a Minute, and 'till it was quite diſſipated about three Minutes. It began to waſte from below, and ſo gradually up, whilſt the upper Part remained entire, without any viſible Alteration, 'till at laſt it ended in the black Cloud above. Upon which there

ſeemed to fall a very heavy Rain in that Neighbourhood. As it waſted, the Bottom of the remaining Part was irregular, ſomewhat like the Trunk of a Tree broke aſunder: There was but little Wind, and the Sky elſewhere was pretty ſerene. We judged the Spout to be above two Leagues off, and I think the Angle under which the ſmall End appeared, muſt be at leaſt 20 Min. According to which Eſtimation, the Thickneſs of it muſt be upwards of 60 Yards, and its Height or Length about three quarters of a Mile.

V. HISTORIA TERRÆMOTUS Apuliam *&* *totum ferè* Neapolitanum *Regnum, Anno* 1731, *vexantis.* *A* Nicolao Cyrillo, *in Regiâ Univerſitate* Neapolitanâ, *Pr. Med. Prof. & R. S. S.*

SCIENTIÆ Naturalis incremento, adeoque noſtræ Societatis Inſtituto valde conſentaneum exiſtimavi, ſi Terræmotûs, qui hoc Anno Apuliam, & ferè univerſum hoc Regnum ſæpè ſucceuſſit, Hiſtoriam hîc attexerem. Rei accidentia Felici Roſeto Medicinæ & Philoſophiæ Doctori, atque in Mathematicis diſciplinis & Humanioribus literis non mediocriter erudito, olim meo Diſcipulo, nunc in eâ Regni regione Medicinam facienti, debeo: ex cujus atque aliorum, & Juvenatij, & Foggiæ degentium Obſervationibus brevem Synopſim concinnabo.

Fig. 1.

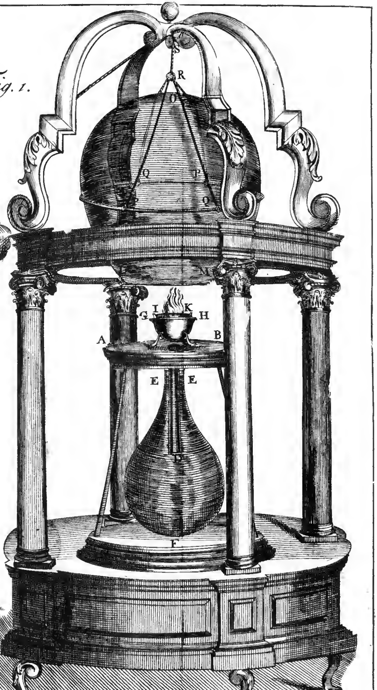

Fig. 2